IEEE P802.15

Wireless Personal Area Networks

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | Issues found in PHY pib attributes | |
| Date Submitted | 16th January 2023 | |
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| Re: | January TG4me meeting | |
| Abstract | Provide list of issues in the PHY pib attributes. | |
| Purpose | TG4me discussion | |
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1. Issues in PHY PIB attributes

While doing the proposal for splitting the Table-11-2, I found following issues, that needs fixing.

1. phyMaxTxPower

This attribute is not defined at all in the Table 11-2.

Signed Integer, –, Upper-bound level of the transmit power of the device that is capable to use.

Read only.

1. phyCcaDuration

In the description it says:

The duration for CCA, specified in symbols for PHYs operating in the 920 MHz band.

But there are other case where it is used in addition to the 920 MHz band. In section 6.2.5.1:

The MAC sublayer shall proceed if the remaining CSMA-CA algorithm steps, i.e., two CCA analyses, or a single continuous CCA analysis of at least phyCcaDuration for the regulatory domains that require listen before talk (LBT) such as the 920 MHz band, as described in “Applications of IEEE Std 802.15.4” [B4], the frame transmission, and any acknowledgment can be completed before the end of the CAP.

and

The MAC sublayer shall proceed if the remaining CSMA-CA algorithm steps, i.e., two CCA analyses, or a single continuous CCA analysis of at least phyCcaDuration for the regulatory domains that require LBT, the frame transmission, and any acknowledgment can be completed before the end of the CAP, and the frame transmission will start in one of the first macBattLifeExtPeriods full backoff periods after the IFS period following the beacon.

And in Table 8-105 MAC sublayer constants for defintion of the aUnitBackoffPeriod:

For all PHYs except SUN PHYs operating in the 920 MHz band, aTurnaroundTime + aCcaTime. For SUN PHYs operating in the 920 MHz band, aTurnaroundTime + phyCcaDuration.

And finally in 10.2.8 Clear channel assessment (CCA):

Except for the 920 MHz band PHYs and the RCC PHYs, the CCA detection time shall be equal to aCcaTime, as defined in Table 11-1. For the 920 MHz band, and the RCC PHYs, phyCcaDuration symbol periods shall be used.

The RCC is not defined for 920 MHz band. I think the correct fix is to change the “operating in the 920 MHz band” to “operating in bands for regulatory domains that require LBT”.

1. phyBroadcastTxPower, phyUnicastTxPower, and phyPeersTxPower

These phy PIB attributes does not have any use anywhere in the standard. Add reference to them in 6.16.3.3 for the itemized list in there.

1. Psdu Fragmentation related PIB attributes

phyFragmentSize, phyPsduFragSecure, phyFragmentFrameCounter are in wrong table in my proposal they should be in Table 11-3, not Table 11-2.

The naming is not consistent, I think all of them should have phyPsduFrag prefix, i.e., do following renaming:

phyFragmentSize → phyPsduFragSize

phyFragmentFrameCounter → phyFragFrameCounter

phyFrakProgressTimeout → phyFragFrakProgressTimeout

(fix the spelling in the 22.3.7.2 where it uses macFrakProgressTimeout instead of phy\*)

phyPsduFragmentationEnabled → phyPsduFragEnabled

(and leave the phyPsduFragSecure as it is now)

1. phyCurrentLecimPhyType

This is inconsistent with other phyLecim names, rename

phyCurrentLecimPhyType → phyLecimCurrentPhyType

1. phyLecimFecTailBitingEnabled

This phy attribute is only for LECIM DSSS, so it should be renamed to say that and moved in my proposal from Table 11-3 to 11-4. Rename and move to 11-4

phyLecimFecTailBitingEnabled → phyLecimDsssFecTailBitingEnabled

1. phyLecimFecEnabled

This attribute is only valid for LECIM FSK, so it should renamed and moved from Table 11-3 to 11-5. Rename and move to 11-5

phyLecimFecEnabled → phyLecimFskFecEnabled

1. phyLecimDsssPpduModulationRate

The are inconsistent spelling of this attribute in section 22.2.2 Data rate, fix it from phyLECIMDSSSPPDUModulationRate to phyLecimDsssPpduModulationRate.

1. phyLecimDsssPsduSpreadingFactor

There are inconsistent spelling of this attribute in section 22.2.2 Data rate fix it from phyLECIMDSSSPSDUSpreadingFactor to phyLecimDsssPsduSpreadingFactor

1. phyLecimDsssPsduOvsfSpreadingFactor

There are inconsistent spelling of this attribute in Table 11-4 for phyLecimDsssPsduOvsfCodeIndex description fix it from phyLecimDsssPSDUOVSFSpreadingFactor to phyLecimDsssPsduOvsfSpreadingFactor.

1. PhyLecimFskSpreadingFactor and phyLecimFskSpreadingPattern

This attribute is used for both Lecim and TVWS FSK. It is confusing to have one phyLecimFsk pib attribute used by another phy. Make them generic, i.e., move them to table 11-10, and rename to phyFskSpreadingFactor, phyFskPreadingPattern, and mark them only for LECIM FSK and TVWS FSK.

1. phyLecimFskSymbolRate

There are inconsistent spelling of this attribute in section 23.3.1 General fix it from phyLECIMFSKSymbolRate to phyLecimFskSymbolRate.

1. phyHrpUwbDataRatesSupported

There is no use of this pib attribute except as an example of pib attributes. Remove it or ask from 802.15.4ab people where to put reference.

1. phyHrpUwbStsKey

The naming of this is confusing as the DRBG (a form of deterministic random number generator) does not has input key, but has input of seed. Also key is defined in the 802.15.4 standard as being:

Privileged information that is used, for example, to protect information from disclosure to, and/or undetectable modification by, parties that do not have access to this privileged information.

And this does not fullfill this definition of key (there is header IE which can send this, thus it cannot be protected in transit. Also the Sts key is not used to protect information from disclosure, or from modifications it is used to generate random bit stream. Rename

phyHrpUwbStsKey → phyHrpUwbStsSeed

Do similar changes for STS key in the whole standard.

1. phyHrpUwbStsRxPacketConfig

There is italics missing of this attribute in the Table 11-7 phyHrpUwbStsPC2RxGap3 description.

1. phyFskFecEnabled

There are inconsistent spelling of this attribute in Figure 24-4, and section 24.2.8, fix them from phyFSKFECEnabled to phyFskFecEnabled.

1. phyFskFecInterleavingRsc

There are inconsistent spelling of this attribute in 24.2.3, fix it from phyFSKFECInterleavingRSC to phyFskFecInterleavingRsc.

1. phyFskFecScheme

The description says this is only “only valid for the SUN FSK PHY”, but is also usd in the 29.2.2.7 FEC, i.e., in the CMB FSK PHY. Change the text “This attribute is only valid for

the SUN FSK PHY and CMB FSK PHY.”

1. phyFskScramblePsdu

The description says this is only valid for the SUN FSK PHY, in that case rename it indicate that and move from table 11-10 to 11-11:

phyFskScramblePsdu → phySunFskScramblePsdu

1. phyModeSwitchEnable and phyModeSwitchParameterEntries

These are only valid for Sun FSK PHY, so rename to indicate that:

phyModeSwitchEnable → phySunFskModeSwitchEnable

phyModeSwitchParameterEntries → phySunFskModeSwitchParameterEntries

1. phyCmbModulation

There is no places where this attribute is used. Remove it.

1. phyCmbGfsk

There is no definition for this PHY PIB entry. Add it. I think it is type of Integer, and values will be 0, 1, but no idea what the description should be. Action item: Phil will find out what is the description of that pib attribute.

1. phyFixedReplyTimeSupported

This seems to be LrpUwb Related, so rename

phyFixedReplyTimeSupported → phyLrpUwbFixedReplyTimeSupported

1. Remove only for xxx from descriptions.

The 11.1 already says:

Attributes that have a prefix of “phyHrpUwb,” e.g., phyHrpUwbDataRatesSupported, apply only to the HRP UWB PHY and are not used for other PHYs.

Which means that any phyHrpUwb\* etc attributes do not need to have text saying for any other phys. We can remove text like: “Set to zero for non-HRP UWB PHYs.”, “This attribute is only valid for the TVWS-FSK PHY.”, “For the LRP UWB PHY,” etc. Remove those extra modifiers.

Also add description before each table saying “TVWS PHY related PIB attributes are described in Table 11-8 and they only apply to TVWS PHY.” etc..